Estimating Change in Rock Permeability Due to Thermal-Mechanical Effects

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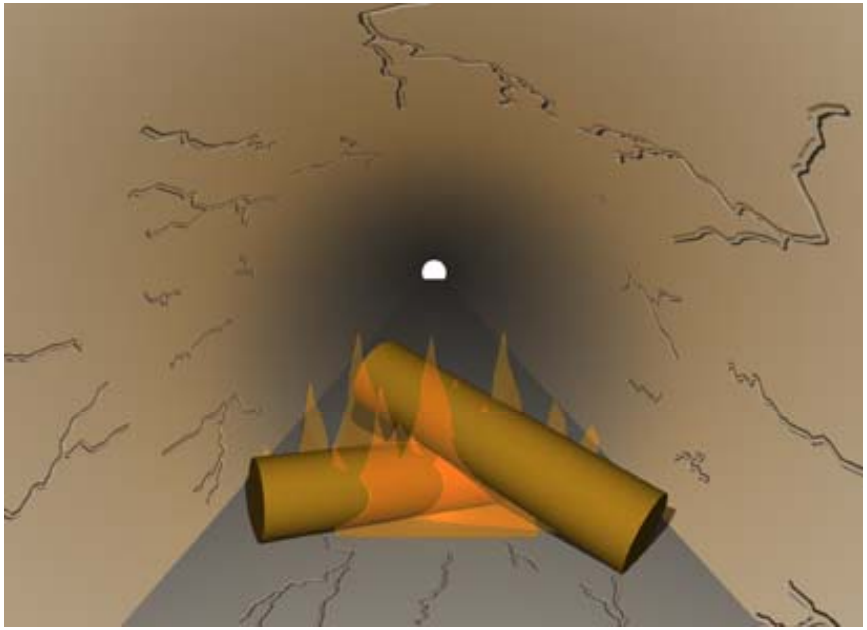
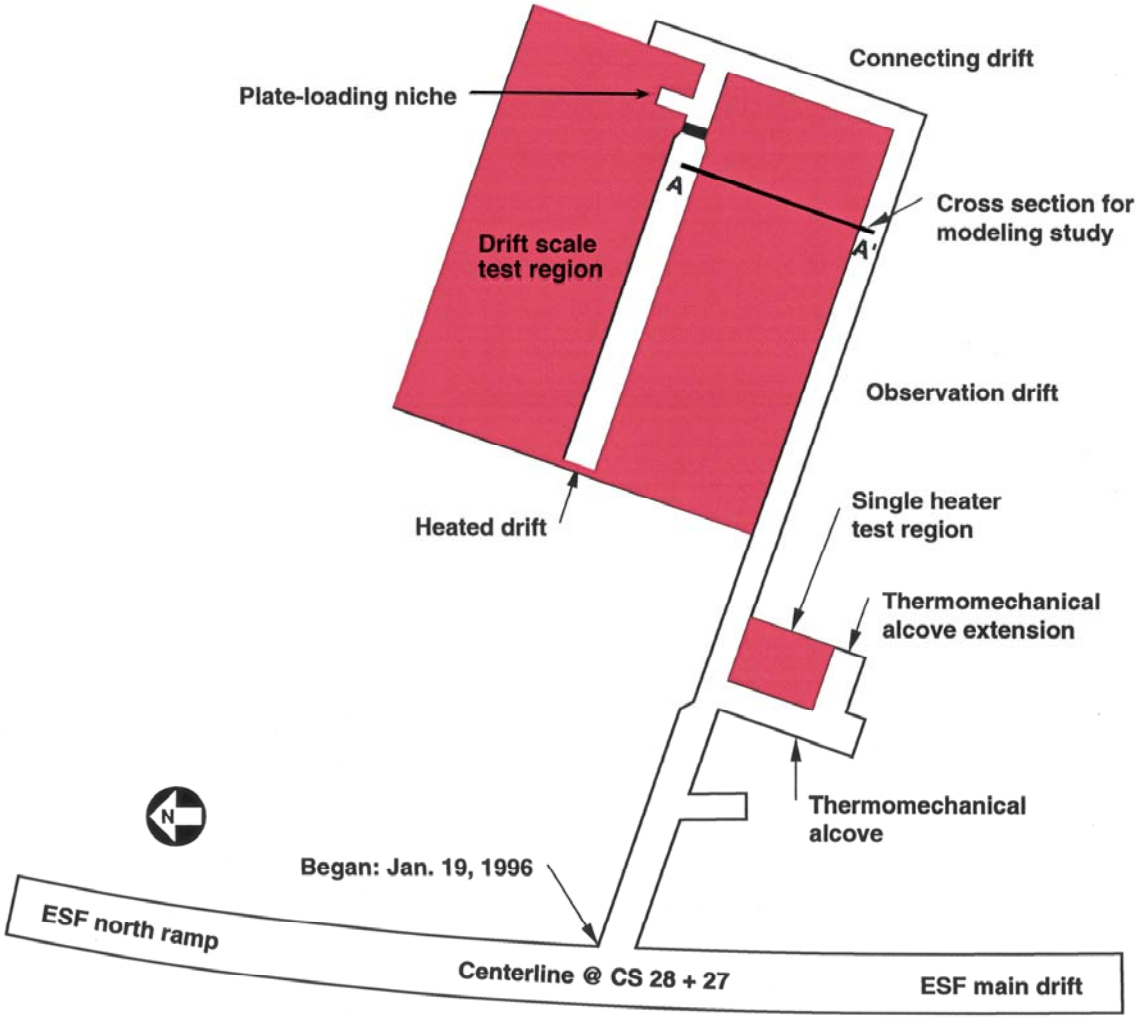


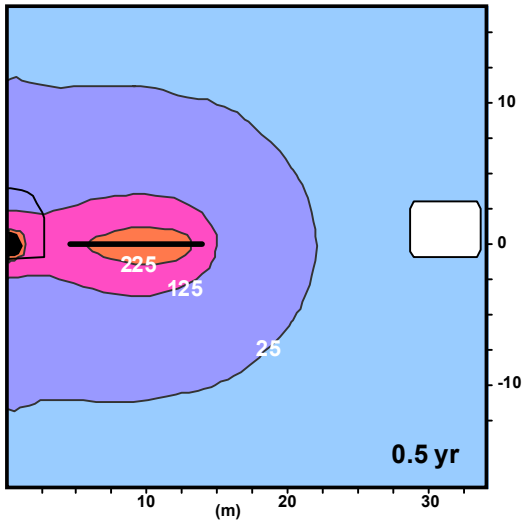
SCHEMATIC OF DRIFT-SCALE TEST

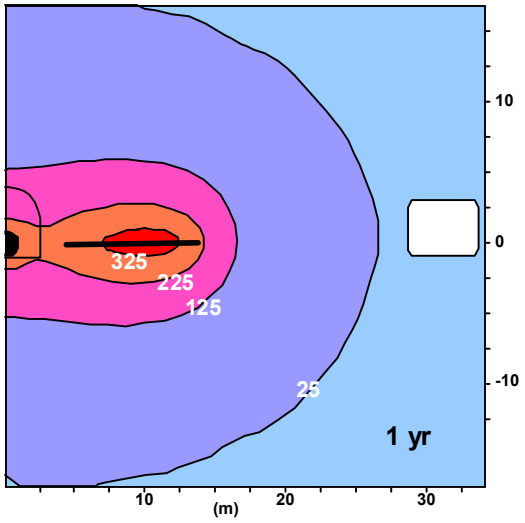


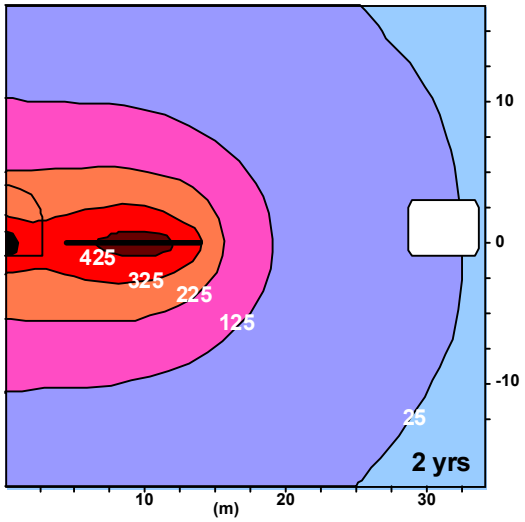
METHODOLGY

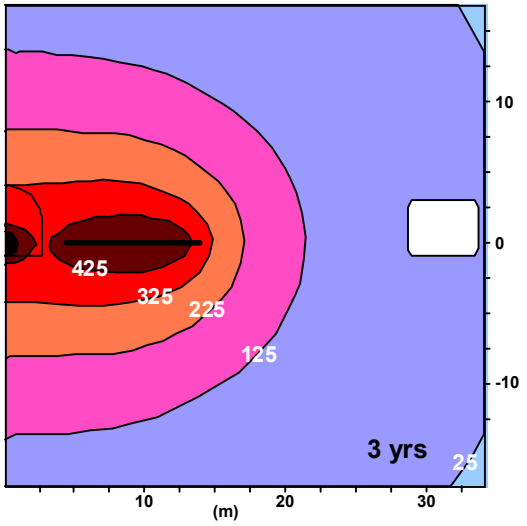
- Calculate temperature field (FLAC 2D).
- Calculate stress field (FLAC 2D).
- Find critically stressed slip planes according to Mohr-Coulomb friction criterion for different fracture orientations. These planes are assumed to be hydraulically conducting.
- Relate shear slip to fractional permeability changes.

TEMPERATURE FIELD

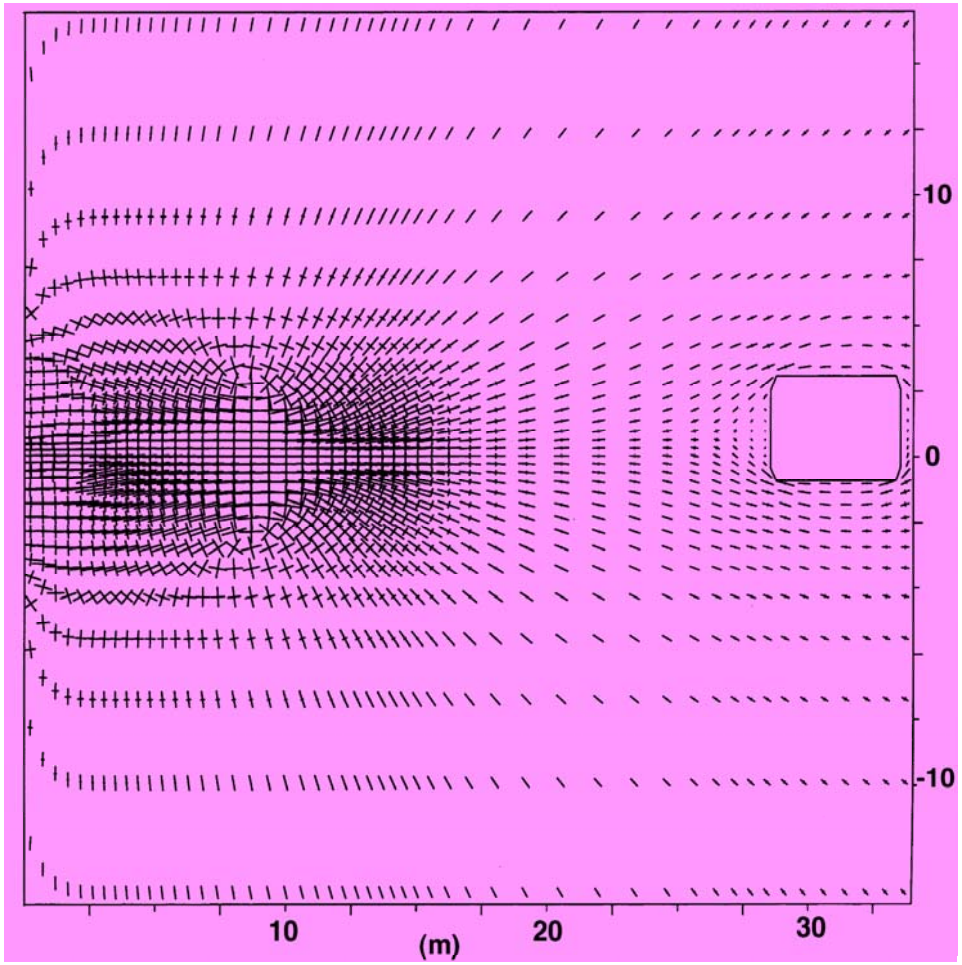








STRESS FIELD — 1 YEAR

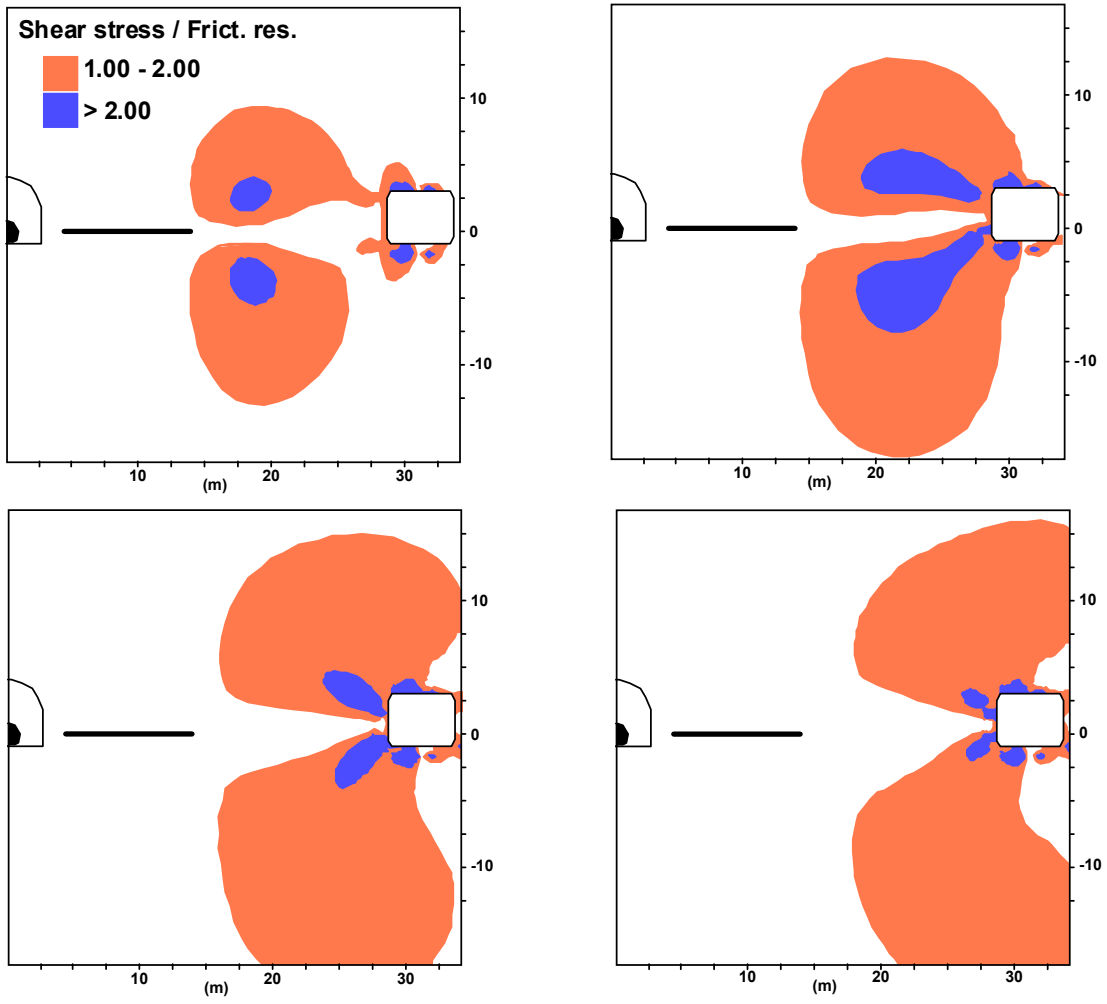


FRACTURE SETS

- Drift-Scale Test region has 3 fracture sets:
  - #1 steep E-W
  - #2 steep N-S
  - #3 subhorizontal E-W
- Sets #1 and #3 are in cross section at 90 and 0 degrees dip to the horizontal, respectively.

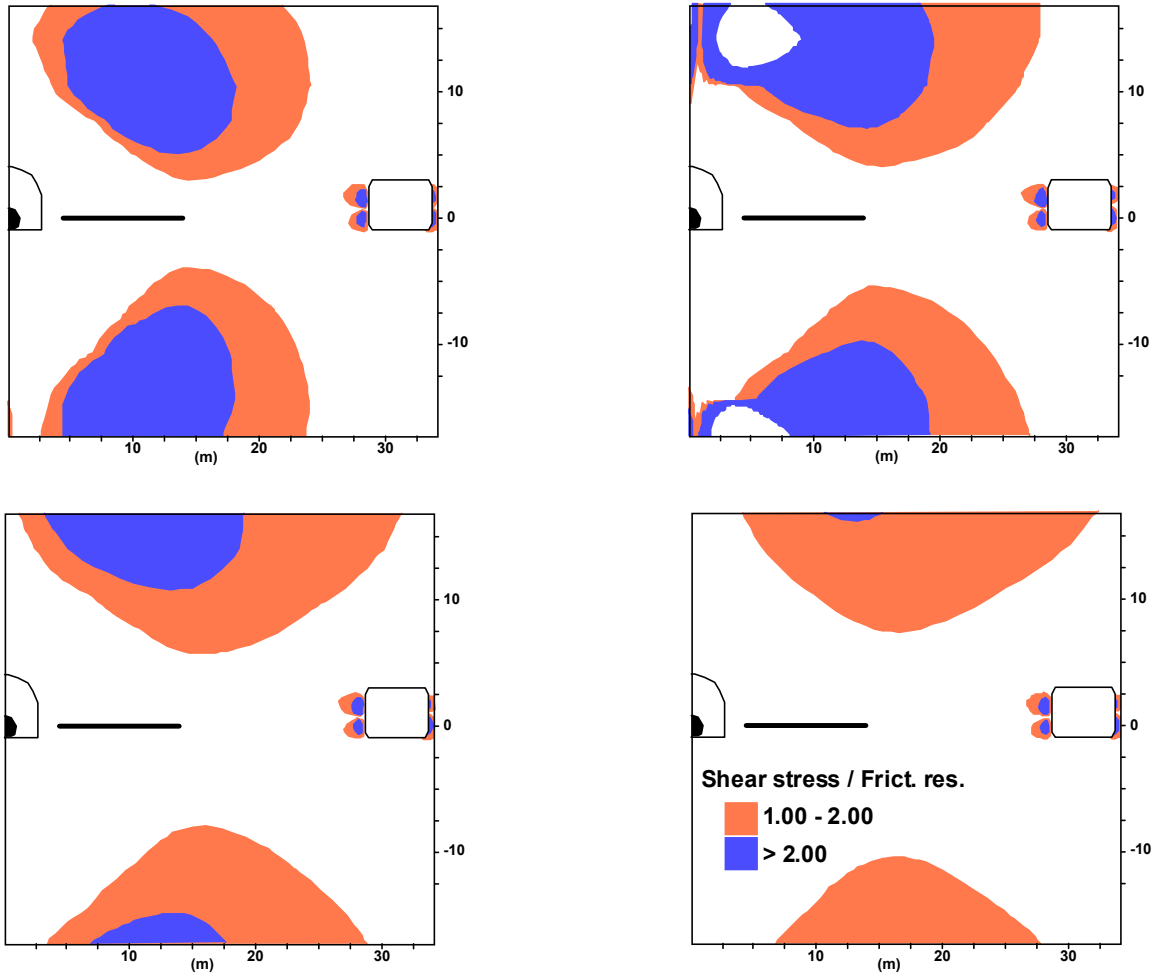
SHEAR STRESS/ FRICTIONAL RESISTANCE

Horizontal Fracture Plane



SHEAR STRESS/ FRICTIONAL RESISTANCE

Vertical Fracture Plane



PERMEABILITY ENHANCEMENT